FINAL

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SAUGET AREA 2, SAUGET, IL

RI/FS SUPPORT SAMPLING PLAN VOL. 6

DATA VALIDATION PLAN

Prepared for

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Submitted by:

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SECTIONONE Introduction

In response to the requirements of an Administrative Order on Consent (AOC) the Sauget Area 2 Sites Group (SA2SG) will perform a Remedial Investigation/Feasibility Study (RI/FS) at Sauget Area 2 Sites O, P, Q, R, and S. The Support Sampling Plan (SSP) for this effort calls for the analytical results from that effort to be independently validated by a third party. Further, the technical performance of the subcontracted laboratory is to be evaluated through submission and analysis of performance evaluation (PE) samples. The results of the validation effort and an evaluation of results from the PE sample will be used to assess the fitness for use of the data generated during the RI/FS.

This work plan describes the tasks and methods of work that will be employed by URS during the data verification and validation and performance evaluation efforts. Section 2.0 of this plan presents background information pertinent to the work. Project organization and management is discussed in section 3.0. Section 4.0 presents a time-sequenced list of tasks associated with the work and the methods of work that will be employed in executing those tasks. Section 5.0 addresses the form and content of work products stemming from the work and section 6.0 presents a schedule for accomplishing the work. References are provided in section 7.0.

SECTION TWO Background and Scope of Work

A complete discussion of the background of this project and scope of work is presented in Volume 1, Site Sampling Plan, of the RI/FS Support Sampling Plan.

The collected samples may be analyzed for one or more of the following:

- Volatile organic compounds
- Semi-volatile organic compounds
- Pesticides
- Herbicides
- PCBs
- Metals
- Dioxins.

In order to ensure the quality and usability of the data derived from those analyses, the SA2SG has established a quality assurance/quality control (QA/QC) program that includes systematic, independent reviews of the analytical laboratory's work products. Two methods of assessment have been identified as a part of that QA/QC program: (1) verification and validation of the analytical data, and, (2) the submission and evaluation of PE samples.

Data validation may be defined as an organized approach to the assessment of analytical data in relation to pre-established performance goals and program objectives. The performance goals are defined in the quality assurance project plan (QAPP) for the work. Program objectives, in this case, are broadly defined as characterizing the nature and extent of environmental contamination, assessing any human health or environmental risks that may be associated with any such contamination, and demonstrating that remedial activities have been effective in removing or isolating any such contamination.

In accordance with US Environmental Protection Agency (USEPA) guidance, the nature of these program objectives is such that data of know quality (definitive type data) are required. Data validation will be employed to define the precision, accuracy and representativeness of the data generated and to define the bounds within which the data may be reliably employed.

A PE sample is a well characterized, neutral media into which known amounts of chemical of interest have been added (spiked). Based on statistical assessment of repetitive analysis of the PE sample, tolerance limits are established that defined the normal range of variability to be

expected in the reported analytical results for that PE sample under a wide variety of analytical conditions. Thus, the results reported by any given laboratory for that PE sample may be compared to the statistical limits previously derived providing an assessment of the laboratory's ability to provide accurate data.

PE samples are often submitted as part of regulatory certification programs. In these cases the PE samples is generally submitted "in the open" (i.e., the laboratory is aware that the sample is a PE sample) but without providing the laboratory with the true values or certified acceptance limits until after the analysis is complete. This type of PE sample is called "single-blind". A more complete assessment of the laboratory's analytical and services systems can be accomplished through the use of a "double-blind" PE sample. In this case the laboratory is unaware that the sample submitted is a PE sample and is not told of the results of the testing until it is completed. For purposes of this program, double-blind PE samples will be employed.

SECTION THREE Project Organization

The responsibilities of the various parties, only those and only as relates to this scope of work, are described below.

3.1 SA2SG

The SA2SG is responsible for contracting with a qualified analytical laboratory for analysis of field and field QC samples and for clearly defining the analytical scope of work, quality control, and deliverable requirements to the laboratory. The SA2SG approves planning documents that contain the specifications for the work, in particular the QAPP, that contains the detailed specifications against which the data will be validated.

The SA2SG develop the sampling and analysis schedule and will work with URS to identify those groups of samples that will be included in the data validation audit. The SA2SG will cause finished data packages for those groups of samples to be forwarded to URS and will serve as a facilitator between URS and the laboratory during the data validation process.

The principle point of contact for the SA2SG is Steve Smith. He may be contacted at:

Solutia Inc.
575 Maryville Centre Drive
St. Louis, MO 63141
Phone: 314/674-4660
Fax: 314/674-8957

3.2 URS PROJECT MANAGER

The URS Project Manager is Robert Veenstra. He may be contacted at:

URS Corporation
2318 Millpark Drive
Maryland Heights, MO 63043
Phone: 314/429-0100
Fax: 314/429-0461

He is responsible for day to day direction of the work performed by URS personnel. He establishes budgets and schedules and monitors performance to same. He makes work assignments to appropriate Task Managers and reviews work products for accuracy and completeness. He coordinates URS's activities with other parties involved in the work and communicates as needed any changes or challenges to the scope of work

SECTIONTHREE Project Organization

3.3 DATA VALIDATION TASK MANAGER

Mr. John Kearns will serve as the URS Data Validation Task Manager. Mr. Kearns may be contacted at:

URS Corporation
849 International Drive, Suite 320
Linthicum, MD 21090
Phone: 410-859-5049
Fax: 410-859-5202

Mr. Kearns is responsible for carrying out the PE study and for conducting the independent data validation. He will cause project-specific data validation checklists to be developed and the data to be reviewed by the data validation staff according to those protocols. He will review and approve individual data validation reports and the final data validation project deliverable. He will cause PE samples to be forwarded to the analytical laboratory, evaluate the results and report on same in accord with the provision of section 4.0.

SECTION FOUR Tasks and Methods of Work

4.1 COORDINATION WITH SA2SG

The URS Project Manager and Data Validation Task Leader will initiate a conference call with the SA2SG for purposes of coordinating schedules and identifying the groups of samples to be included in the data validation audit.

4.2 DISTRIBUTE PE SAMPLES

URS will acquire double blind PE samples from Environmental Resource Associates (ERA). PE samples will be submitted to the laboratory from a remote URS office location under an assumed project name. The Data Validation Task Leader will request a bottle shipment from the laboratory, pack the PE samples for return shipment and submit the samples, properly preserved and under chain of custody, with a trip blank included. Samples will be submitted on two separate days.

Upon receipt of the data package, URS will validate the data package (see section 4.4) and assess the analytical results in relation to the certified values provided by ERA. A report of findings will be generated (see section 5.0) and three copies will be forwarded to the URS Project Manager for subsequent transmission to the SA2SG. At the request of the SA2SG a copy of the report will also be forwarded to the laboratory with a request that they investigate and address any deficiencies noted in the report. URS will follow-up with the laboratory until such time as a response is received, evaluate the response and provide commentary to the URS Project Manager for subsequent transmission to the SA2SG.

4.3 FINALIZE PROJECT-SPECIFIC DATA VALIDATION CHECKLISTS

Appendix A contains data validation checklists based on the USEPA National Functional Guidelines, modified for the RCRA methods of analysis anticipated to be used during this work. Both Level III and Level IV validation are to be performed. A Level III validation is defined as a review of the data for all of the elements of validation contained in the USEPA National Functional Guidelines (NFGs) for Organic (and Inorganic) Data Review, however, only summary form information is assessed. There is no attempt to verify calculations and only cursory assessment of compound identification criteria and quantitative statements.

A Level IV review includes all the elements of the Level II review but also entails a detailed review for raw data and confirmation of calculations performed by the laboratory.

SECTION FOUR Tasks and Methods of Work

The specifications of the NFGs are modified such that the specifications of the analytical method and project-specific QAPP take precedence over the specifications of the NFGs to the extent that those specifications differ.

To the extent necessary, URS will modify the checklists presented in Appendix A to incorporate specific quality control (QC) acceptance criteria from the QAPP. Those finalized checklists will be employed in the data validation process discussed below.

4.4 DATA VALIDATION

The SA2SG will cause the data packages containing the groups of sample results agreed upon in section 4.1 to be forwarded to the URS Data Validation Task Manager. Upon receipt, a staff chemist will log in the data packages noting the audit samples contained in each and performing a cursory completeness check on the deliverables. Any discrepancies will be referred to the SA2SG for resolution prior to initiating validation activities.

Upon acceptance, the data package will be referred to one of the staff chemists for review. The chemist will verify the contents of the data packages against the requirements summarized in the appropriate data validation checklist(s) for the method(s) of analysis involved. Any deviations from the requirements are noted on the validation checklists and supporting documentation pertaining to any such deviation is copied for subsequent inclusion in the validation records (see section 5.0). Following the instructions in the data validation checklists, the staff chemist applies data qualifying flags to the analytical result report forms.

When the review is completed the staff chemist will draft a summary report for the data package, cover the draft report with a Quality Control Checklist and forward the completed draft to a project chemist for peer review.

The project chemist will perform a two sided audit of the work produced by the staff chemist working first from his/her independent observations to the draft data validation report and flagged data report forms, and, in reverse from the draft data validation report and flagged report forms to the data package. Any questions or concerns raised by the project chemist are documented in the report and on the Quality Control Checklist. Those issues will be resolved between the staff and project chemists and a draft final report is forwarded to the Data Validation Task Manager for review and approval.

SECTION FOUR Tasks and Methods of Work

The Data Validation Task Manager reviews the report for any indications of inconsistent application of logic, challenges any instances of rejected data to ensure that the maximum amount of useful information is retained, and verifies the correctness and completeness of the deliverable. When all individual data validation reports are completed the Data Validation Task Manager drafts the project summary section of the final deliverable. Copies of the finished deliverable will be forwarded to the URS Project Manager for subsequent transmission to the SA2SG.

SECTIONFIVE Reporting and Deliverables

5.1 PE SAMPLE ASSESSMENT REPORT

The PE sample assessment report will consist of a brief narrative description of the study methods; a data validation report (see section 5.2); a tabular presentation of the results of the laboratory analysis to the certified ranges; and, summary recommendations.

5.2 DATA VALIDATION REPORT

The data validation report will consist of a brief narrative description of the methods of work employed; a project summary organized around data quality indicators (i.e., precision, accuracy, representativness, comparability, completeness, and sensitivity) with summary recommendations; and, appendices containing individual data validation reports for the data reports reviewed. An example of an individual data validation report is contained in Appendix B.

SECTIONSIX Schedule

A complete project schedule is presented in Section 15 of the Volume 1, Site Sampling Plan.

SECTIONSEVEN References

USEPA, 1994a. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94/012, US Environmental Protection Agency, February, 1994.

USEPA, 1994b. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94/013, US Environmental Protection Agency, February, 1994.

USEPA, 1999. SW-846, Test Methods for Evaluating Solid Wastes, 3rd Ed, 3rd Update, US Environmental Protection Agency, July, 1999.

APPENDIX A Data Validation Worksheets

DATA VALIDATION WORKSHEET
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: _____ **Project Name:** _____

Date: _____ **Project Number:** _____

Lab: _____ **SDG No.:** _____

1.0 Chain of Custody/Sample Condition

		Yes	NO	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			

Note: _____

2.0 Holding Time/ Preservation

		Yes	NO	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?			
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated, based on professional judgement the reviewer may flag positive results with a "J" and non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-).			

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{O}C $\pm$ 2 ^{O}C	14 days	14 days

	For method 5035 prepared soil samples, reference the preservation and holding time requirements of the published method.			
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			

Note: _____

3.0 GC/MS Instrument Performance Check

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?			
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, applying professional judgement, the reviewer may flag R.			
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.			

Note: _____

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?			
4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?			
4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?			
4.4	Are there field/trip/rinse/equipment blanks associated with every sample?			
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
4.5	If Level IV, review raw data and verify all detections for blanks were reported.			

Note: _____

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?			
5.2	Are calibrations linear applying either %RSD <15% or r >0.990?			
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detect "R".			
5.3	Do any compounds have an RRF < 0.05 (use 0.1 for poor responders like acetone and 2-butanone)? If yes, J(+)/R(-).			
5.4	Is the lowest standard at the same concentration as the RL reported? If not, elevate RL.			
5.5	If Level IV, calculate a RRF and a %RSD to verify correct calculations are being made.			

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?			
6.2	Has a continuing calibration standard been analyzed for every 12 hours?			
6.3	Do any compounds have a % difference (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?			
	If yes, a marginal increase (i.e., <50%) in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
6.4	Do any compounds have an RRF < 0.05 (use 0.1 for poor responders like acetone and 2-butanone)? If yes, J(+)/R(-).			
6.5	If Level IV, calculate a compounds RF and %D from ave RF to verify correctcalculations.			

Note: _____

7.0 Surrogate Recovery/ SMC (System Monitoring Compounds)

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
7.2	Are surrogate recoveries within acceptance criteria provided by the laboratory for all samples?			
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Note: If SMC recoveries do not meet acceptance criteria in samples chosen for the MS/MSD or diluted

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note: _____

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?			
8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria specified in the QAPP?			
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			

Note: _____

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?			
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?			
9.3	Are all LCS %Rs within acceptance criteria provided by the laboratory?			
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; %R<LCL, J(+)/R(-).			

Note: _____

10. Internal Standards

					Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits?						
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?						
	Action: For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for non-detects of that sample fraction.						

Note: _____

11.0 TCL Identification (Only for Level IV Review)		Yes	No	NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?			
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?			

Note: _____

12.0 TCL/TIC Quantitation and Reported Detection limits		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?			
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?			
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".			
12.5	If Level IV, calculate a few positive results using the curve RF to verify correct calculations			

Note: _____

13.0 Field Duplicate Samples		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?			
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?			
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a qualitative assessment in the data validation report.			

Note: _____

14.0 Data Completeness		Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% for soil sample)			
14.1.1	Number of samples:_____			
14.1.2	Number of target compounds in each analysis:_____			
14.1.3	Number of results rejected and not reported:_____			
	% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)			
	% Completeness = _____			

Note: _____

DATA VALIDATION WORKSHEET
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: _____ **Project Name:** _____
Date: _____ **Project Number:** _____
Lab: _____ **SDG No.:** _____

1.0 Chain of Custody/Sample Condition		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			

Note: _____

2.0 Preservation/ Holding Time		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?			
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached			
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).			

Note: _____

3.0 GC/MS Instrument Performance Check		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?			
3.2	Have all samples been analyzed within twelve hours of the tune?			
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?			
	If no, applying professional judgement standards, blanks, field samples and QC samples may be rejected "R".			

Note: _____

4.0 Blanks (Method Blanks and Field Blanks)		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?			
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?			
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?			
	Action: Positive sample results <5X (or 10X for common lab contaminants) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
4.4	If Level IV, review raw data and verify all detections for blanks were reported.			

Note: _____

5.0 GC/MS Initial Calibration		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?			
5.2	Are calibrations linear applying either %RSD <15 or R >0.99? If no, J(+)/UJ(-).			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-).			
5.4	If Level IV, verify a RRF and a %RSD calculation.			

Note: _____

6.0 Continuing Calibration		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?			
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis?			
6.3	Do any compounds have a % difference (%D) between initial and continuing calibration RRF > 20%?			
	If yes, a marginal increase (i.e., <50%) in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/ R(-).			
6.5	If Level IV, verify a %D calculation.			

Note: _____

7.0 Surrogate Recovery		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
7.2	Are surrogate recoveries within acceptance criteria provided by the laboratory for all samples and method blanks?			
7.3	Are more than one of either fraction outside the acceptance criteria?			
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?			
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?			
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.			

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) of MS and a field sample duplicate		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?			
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided in the QAPP?			
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			

Note:

9.0 Laboratory Control Sample (LCS)		Yes	No	NA
9.1	Is an LCS recovery form present?			
9.2	Is LCS analyzed at the required frequency for each matrix?			
9.3	Are all LCS %Rs within acceptance criteria?			
	If no, for individual compounds with %R>UCL, J(+) only; %R<LCL, J(+)/R(-). If more than half of the spike compounds display unacceptable recoveries, use professional judgement to qualify data.			
9.4	If Level IV, verify the % recoveries are calculated correctly.			

Note:

10.0 Internal Standards					Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing						
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?						
	Action: The chromatogram must be examined to determine if any false positives or negatives exist.						

Note: _____

11.0 TCL/TIC Quantitation and Reported Detection Limits (Level IV Only)		Yes	No	NA
11.1	Are RLs adjusted to reflect sample dilution(s) and, for soil, sample moisture?			
11.2	Were any compounds reported at levels exceeding the linear range of the instrument? If yes, flag "J"			
11.3	If Level IV, Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?			
11.4	If Level IV, are all ions present in the standard spectrum at a relative intensity greater than 10% also present in the sample spectrum; and do sample and standard ion intensities agree within 30%?			
11.5	If Level IV, are ions >10% in the reference spectrum present in the sample TIC and agree within 20%?			

Note: _____

12.0 Field Duplicate Samples		Yes	No	NA
12.1	Were any field duplicates submitted for VOC analysis?			
12.2	Were all RPD or absolute difference values within the control limits?			
	No action is taken based on field duplicate results.			

Note: _____

13.0 Data Completeness		Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90%			
13.1.1	Number of samples:_____			
13.1.2	Number of target compounds in each analysis:_____			
13.1.3	Number of results rejected and not reported:_____			
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)			
	% Completeness = _____			

Note: _____

DATA VALIDATION WORKSHEET
PESTICIDE/PCB ANALYSIS - NFGs Modified for RCRA

Reviewer: _____ **Project Name:** _____

Date: _____ **Project Number:** _____

Lab: _____ **SDG No.:** _____

1.0 Chain of Custody/Sample Condition		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples which were analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
1.4	Do sample preservation, collection and storage condition meet method requirement?			
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated, based on professional judgement the reviewer may flag positive results with a "J" and non-detects "UJ".			

Note: _____

2.0 Holding Time		**Yes**	**No**	**NA**
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See			
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			

Note: _____

3.0 Blanks (Method Blanks and Field Blanks)		**Yes**	**No**	**NA**
3.1	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?			
3.2	Has a method blank been analyzed for each batch?			
3.3	Do any blanks have positive results?			
3.4	Are there field equipment blanks associated with every sample?			
	Action: Positive sample results <5X the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
3.5	If Level IV, review raw data and verify all detections for blanks were reported.			

Note: _____

4.0 Initial Calibration		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?			
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? If no, J(+)/UJ(-).			
4.3	If Level IV, verify a RRF and a %RSD calculation.			

Note:

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).			
5.2	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).			
5.3	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).			

Note:

6.0 Continuing Calibration		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?			
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?			
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)?			
	If yes, a marginal increase (i.e., <50%) in response >15% then J(+) only; a decrease in response then J(+)/UJ(-). For %D > 50%, flag R(-); J(+).			
6.4	If Level IV, verify a %D calculation.			

Note:

7.0 Surrogate Recovery		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
7.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (recoveries may be diluted out.)			
	Note: If recoveries are unacceptable for MS/MSD and/or diluted samples, then no reanalysis is required.			

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note: _____

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?			
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?			
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			

Note: _____

9.0 Laboratory Control Sample (LCS)		Yes	No	NA
9.1	Is an LCS recovery form present?			
9.2	Is LCS analyzed at the required frequency for each matrix?			
9.3	Are all LCS %Rs within acceptance criteria? If no, for %R>UCL, J(+) only; %R<LCL, J(+)/R(-).			
9.4	If Level IV, verify the % recoveries are calculated correctly.			

Note: _____

10.0 TCL/TIC Quantitation and Reported Detection Limits (Level IV Only)		Yes	No	NA
10.1	Are RLs adjusted to reflect sample dilution(s) and, for soil, sample moisture?			
10.2	Does the retention time of each reported compound fall within the RT window? If not, inquire of lab, change results if necessary.			
10.3	Is there evidence of unreported peaks? If yes, inquire of laboratory, calculate and add results if necessary.			
10.4	Verify confirmation requirements have been implemented per SW-846 specifications, if not inquire of laboratory;correct results if necessary.			

Note: _____

11.0 Field Duplicate Samples		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?			
11.2	Were all RPD or absolute difference values within the control limits?			
	No action is taken based on field duplicate results.			

Note: _____

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Check QAPP or use 95% for aqueous or 90% for soil)			
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Note: _____

DATA VALIDATION WORKSHEET
INORGANIC - ICP, ICP-MS, GFAA, and CVAA - for RCRA

SDG No.: _____ **Project Name:** _____

Lab: _____ **Reviewer:** _____

Date: _____

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?												
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?												
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?												
1.4	If samples were not properly preserved, or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated, based on professional judgement the reviewer may flag positive results with a "J" and non-detects "UJ".												
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.												

Note: _____

2.0 Holding Time

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).												

Note: _____

3.0 Quantitation (Level IV Only)

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Verify transcription and calculations for a minimum of one results for each form. Extent the audit and make corrections as necessary if errors are encountered.												
3.2	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?												
3.3	Were all dilution reflected in the positive results and detection limits?												
3.4	Was MSA used when required by the method? Contact laboratory, correct results or flag J(+);UJ(-)												

Note: _____

4.0 Instrument Calibration

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards with one at [CRDL]; CVAA: blank + five standards with one at [CRDL]) If not, applying professional judgement the reviewer may flag J(+); R(-).												
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).												
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.												
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.												
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).												

Action:	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: _____

5.0 Blanks

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per batch)?												
5.2	Are there reported PB values > MDL?												
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, make a note in the DV Report.												
5.5	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, make a note in the DV Report.												
5.5	Are there reported ICB or CCB values > MDL?												
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, flag U at reported concentration.												
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).												
5.8	If level IV, review all raw data blank results and verify that the results were reported correctly.												

Note: _____

DATA VALIDATION WORKSHEET
HERBICIDES ANALYSIS - NFG modified for RCRA

Reviewer: _____ **Project Name:** _____

Date: _____ **Project Number:** _____

Lab: _____ **SDG No.:** _____

1.0 Chain of Custody/Sample Condition		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			

Note: _____

2.0 Preservation/ Holding Time		**Yes**	**No**	**NA**
2.1	Do sample preservation, collection and storage condition meet method requirement?			
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated, based on professional judgement the reviewer may flag positive results with a "J" and			
2.2	Have any technical holding times, from sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-).			
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			

Note: _____

3.0 Blanks (Method Blanks and Field Blanks)		**Yes**	**No**	**NA**
3.1	Is a Method Blank Summary form present for batch?			
3.2	Do any method/instrument/reagent blanks have positive results?			
3.3	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.			
	Action: Positive sample results <5X the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			

Note: _____

4.0 Initial Calibration		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?			
4.2	Are five standards included in the calibration curve?			
4.3	Are response factors stable (%RSD values < 20% or r > 0.995)? If not, J(+)/UJ(-).			
4.4	If Level IV, verify a %RSD calculation.			

Note: _____

5.0 Continuing Calibration		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?			
5.2	Has a CCC been analyzed at the beginning of each day, every 10 samples, and at the end of the run?			
5.3	Do any compounds have a %D > 15%?			
	If yes, a marginal increase (i.e., <50%) in response >15% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
5.4	If Level IV, verify a %D calculation.			

Note: _____

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?.			
	Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.			

%R	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note: _____

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?			
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?			
7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?			
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			

Note: _____

8.0 Laboratory Control Sample (LCS)		Yes	No	NA
8.1	Is an LCS recovery form present?			
8.2	Is LCS analyzed at the required frequency for each matrix?			
8.3	Are all LCS %Rs within acceptance criteria?			
	If no, for individual compounds with %R>UCL, J(+) only; %R<LCL, J(+)/R(-). If more than half of the spike			
8.4	If Level IV, verify the % recoveries are calculated correctly.			

Note: _____

9.0 TCL Quantitation and Identification (Level IV Only)		Yes	No	NA
9.1	Are RLs adjusted to reflect sample dilution(s) and, for soil, sample moisture?			
9.2	Does the retention time of each reported compound fall within the RT window? If not, inquire of lab, change			
9.3	Is there evidence of unreported peaks? If yes, inquire of laboratory, calculate and add results if necessary.			
9.4	Verify confirmation requirements have been implemented per SW-846 specifications, if not inquire of laboratory;correct results if necessary.			

Note: _____

10.0 Field Duplicate Samples		Yes	No	NA
10.1	Were any field duplicates submitted for analysis?			
10.2	Were all RPD or absolute difference values within the control limits?			
	No action is taken based on field duplicate results alone.			

Note: _____

_____

_____

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (95% for aqueous, 90% for soil)			
11.1.1	Number of samples:_____			
11.1.2	Number of target compounds in each analysis:_____			
11.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Note: _____

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: _____
Date: _____
DV Level: II III IV
Review Document:
_X_ NFG/SW-846

Project Name: _____
Project Number: _____
Laboratory: _____
SDG No.: _____
Method No.: _____

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Does sample preservation, collection and storage meet method requirement?			
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-).			
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .			

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?			
3.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?			
3.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?			
	Action: Positive sample results <5X (or 10X for phthalate contaminants) the highest blank concentration should be qualified "U" and the result elevated to the RL for values less than the RL.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			

Notes:

4.0 Instrument Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, note in the DV Report.			
4.2	Was a tune run at the start of every twelve hours? If no, note in the DV Report.			
4.3	Was a CCV analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			
4.4	Are all target compound %RSDs and/or %Ds within ± 20%? If not apply J(+)/UJ(-).			
4.5	Are all reference compound %RSDs and/or %Ds within ± 30%? If not apply J(+)/R(-).			
4.6	If Level IV, check for any transcription/calculation errors.			

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
5.3	Was a field blank used for MS/MSD analyses?			
5.4	Are there any %R or %RPDs outside the laboratory QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
5.5	If Level IV, were there any transcription /calculation errors?			

Notes:

6.0 Laboratory Control Sample (LCS)		Yes	No	NA
6.1	Is the LCS recovery form present?			
6.2	Were LCS analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?			
	If no, for individual compounds with %R>UCL, J(+) only; %R<LCL, J(+)/R(-). If more than half of the spike			
6.4	If Level IV, were there any transcription /calculation errors?			

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate analyzed?			
7.2	Are all analyte duplicate results within control limits?			
	No action is taken based on duplicate results.			

Notes:

8.0 Sample Results/Detection Limit Verification		Yes	No	NA
8.1	Are all sample results within the calibrated range? If not apply J(+) only.			
8.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?			
8.3	If Level IV, were there any transcription /calculation errors?			

Notes:

9.0 Internal Standard and Clean-Up Standard Recovery				Yes	No	NA
9.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?					
9.2	Are standard recoveries within acceptance criteria for all samples and method blanks?					
9.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?					
9.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)					
		> UCL	10% to LCL	< 10%		
	Positive	J	J	J		
	Non-detect	None	UJ	R		

Notes:

10.0 Identification and Quantitation (Level IV Only)		Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?			
10.2	Are these limits adjusted as required for moisture and dilutions?			
10.3	Are any positive results reproted exceeding the linear range of the calibration?			
10.4	Calculate a minimum of one result for each form. Increase audit and correct results as necessary.			

Notes:

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (aqueous: 95% and soil: 90%)			
11.1.1	Number of samples:_____			
11.1.2	Number of target compounds in each analysis:_____			
11.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

APPENDIX B Example Data Validation Report

DATA VALIDATION REPORT - Level IV Review

SDG No.: L15229 **Fraction:** VOCs - CLP

Lab: STL - Quanterra **Project Name:**

Reviewer: JA **Date:** February 15, 2000

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the data review checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the National Functional Guidelines for Organic Data Review (February 1994) and the specifics of the analytical method employed.

Major Anomalies: None.

Minor Anomalies: The VOCs acetone (39.9%), 2-butanone (32.9%), and 2-hexanone (35.1%) displayed %Ds greater than the acceptance criterion in one continuing calibration (12/21/99 09:05). Acetone, 2-butanone, and 2-hexanone results in the associated samples were flagged "UJ, c". The VOCs chloroethane (-32.8%), acetone (46.7%), 2-butanone (32.8%), and 2-hexanone (31.8%) displayed %Ds greater than the acceptance criterion in one continuing calibration (12/22/99 09:23). These four results in the associated samples were flagged as "J" or "UJ, c".

The method blank, VBLK2, contained two tentatively identified compounds (TICs, hexamethylcyclotrisiloxane at 6 µg/L and octamethylcyclotetrasiloxane at 10 µg/L). Since these two siloxanes are known released from the analytical column, all siloxane results were crossed out by the reviewer. The storage blank, VHBLK1, contained acetone at 9 µg/L and one TIC (octamethylcyclotetra-siloxane) at 8 µg/L. Acetone results in the associated samples were flagged as non-detects at the CRDL. Since the siloxane result was crossed out due to released from the analytical column, this siloxane result was not used to assess associated samples.

The trip blank contained acetone at 7 µg/L. The equipment blank, EB2, contained acetone at 9 µg/L and one TIC (octamethylcyclotetrasiloxane) at 8 µg/L. Since acetone results were previously flagged as non-detects due to storage blank contamination, these results were not used to assess associated samples. Since the siloxane result was crossed out due to released from the analytical column, this siloxane result was not used to assess associated samples.

All TICs, except those crossed out due to released from analytical column, were flagged "NJ, Q".

Correctable Anomalies: None.

Comments: The CRDLs were raised in samples MW07D, MW08D, MW38D, and MW38DDup due to dilution.

Signed: Qi, Chai-chun

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SDG NARRATIVE

This narrative pertains to samples received from the Dames & Moore from the Site. This data package, completed by Severn Trent Laboratories, Inc. formerly Quanterra Incorporated North Canton, consists of data from the volatile analyses of eleven (11) water samples analyzed using the CLP SOW OLM03.1 protocol.

Preliminary results were provided by facsimile transmission to Bruce Pletch on January 3, 2000.

The following is a listing of the samples in SDG L15229:

Client ID	Laboratory ID	Sample Receipt Date
MW08D	D6D75	12/15/99
DISCH-1	D6D7C	12/15/99
DISCH-1DUP	D6D7E	12/15/99
MW38D	D6D7F	12/15/99
MW38DDUP	D6D7H	12/15/99
FB2	D6D7J	12/15/99
MW07S	D6D7K	12/15/99
MW07D	D6D7L	12/15/99
MW04S	D6D7M	12/15/99
MW04D	D6D7P	12/15/99
TRPBLK	D6DC9	12/15/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FB2

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7J101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6475

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	10,U ~~9~~	~~U~~	UJ,z,c
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	UJ,c
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ,c
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

FB2

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7J101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6475

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.80~~	~~10~~	~~NJB~~
2.					
3.					
4.					
5.					
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DISCH-1

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7C101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6490

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
74-87-3	Chloromethane		10	U
74-83-9	Bromomethane		10	U
75-01-4	Vinyl Chloride		10	U
75-00-3	Chloroethane		10	U
75-09-2	Methylene Chloride		10	U
67-64-1	Acetone	10U	~~5~~ 10	~~J~~ U (JA)
75-15-0	Carbon Disulfide		10	U
75-35-4	1,1-Dichloroethene		10	U
75-34-3	1,1-Dichloroethane		10	U
540-59-0	1,2-Dichloroethene (total)		10	U
67-66-3	Chloroform		10	U
107-06-2	1,2-Dichloroethane		10	U
78-93-3	2-Butanone		6	J
71-55-6	1,1,1-Trichloroethane		10	U
56-23-5	Carbon Tetrachloride		10	U
75-27-4	Bromodichloromethane		10	U
78-87-5	1,2-Dichloropropane		10	U
10061-01-5	cis-1,3-Dichloropropene		10	U
79-01-6	Trichloroethene		10	U
124-48-1	Dibromochloromethane		10	U
79-00-5	1,1,2-Trichloroethane		10	U
71-43-2	Benzene		10	U
10061-02-6	trans-1,3-Dichloropropene		10	U
75-25-2	Bromoform		10	U
108-10-1	4-Methyl-2-pentanone		10	U
591-78-6	2-Hexanone		10	U
127-18-4	Tetrachloroethene		10	U
79-34-5	1,1,2,2-Tetrachloroethane		10	U
108-88-3	Toluene		10	U
108-90-7	Chlorobenzene		10	U
100-41-4	Ethylbenzene		10	U
100-42-5	Styrene		10	U
1330-20-7	Xylenes (total)		10	U

UJ,c

UJ,zc

J,c

UJ,c

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DISCH-1

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7C101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6490

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	111-76-2	ETHANOL, 2-BUTOXY-	16.16	10	NJ	NJ,Q
2.	27869-56-3	BENZENE, 1-PHENYL-4-(2-CYANO	16.82	12	NJ	NJ,Q
3.						
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Q: TICs

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DISCH-1DUP

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7E101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6491

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	UJ,C
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	10 ~~6~~	~~J~~ (B)	UJ,ZC
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	6	J	J,C
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-43-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ,C
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DISCH-1DUP

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7E101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6491

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	111-76-2	ETHANOL, 2-BUTOXY-	16.25	10	NJ
2.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.91~~	~~20~~	~~NJ~~
3.					
4.					
5.					
6.					
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NJ Q

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7P101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6494

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	UJ,c
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	10U ~~4~~	~~J~~	UJ,zc
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	UJ,c
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ,c
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW04D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7P101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6494

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.82~~	~~6~~	~~NJ~~
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04S

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7M101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6493

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	UJ,C
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	10U ~~5~~	~~J~~	UJ,ZC
75-15-0	Carbon Disulfide	10	U (A)	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	UJ,C
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ,C
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW04S

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7M101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6493

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.95~~	~~18~~	~~NJ~~
2.					
3.					
4.					
5.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW07D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7L101

Sample wt/vol: 0.750 (g/ML) ML Lab File ID: VOL6486

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	67	U	
74-83-9	Bromomethane	67	U	
75-01-4	Vinyl Chloride	67	U	
75-00-3	Chloroethane	67	U	UJ,C
75-09-2	Methylene Chloride	67	U	
67-64-1	Acetone	67	U	UJ,C
75-15-0	Carbon Disulfide	67	U	
75-35-4	1,1-Dichloroethene	67	U	
75-34-3	1,1-Dichloroethane	67	U	
540-59-0	1,2-Dichloroethene (total)	67	U	
67-66-3	Chloroform	67	U	
107-06-2	1,2-Dichloroethane	67	U	
78-93-3	2-Butanone	67	U	UJ,C
71-55-6	1,1,1-Trichloroethane	67	U	
56-23-5	Carbon Tetrachloride	110		
75-27-4	Bromodichloromethane	67	U	
78-87-5	1,2-Dichloropropane	67	U	
10061-01-5	cis-1,3-Dichloropropene	67	U	
79-01-6	Trichloroethene	1100		
124-48-1	Dibromochloromethane	67	U	
79-00-5	1,1,2-Trichloroethane	67	U	
71-43-2	Benzene	67	U	
10061-02-6	trans-1,3-Dichloropropene	67	U	
75-25-2	Bromoform	67	U	
108-10-1	4-Methyl-2-pentanone	67	U	
591-78-6	2-Hexanone	67	U	UJ,C
127-18-4	Tetrachloroethene	67	U	
79-34-5	1,1,2,2-Tetrachloroethane	67	U	
108-88-3	Toluene	67	U	
108-90-7	Chlorobenzene	67	U	
100-41-4	Ethylbenzene	67	U	
100-42-5	Styrene	67	U	
1330-20-7	Xylenes (total)	67	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW07D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7L101

Sample wt/vol: 0.750 (g/ML) ML Lab File ID: VOL6486

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	19.50	68	J
2.					
3.					
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NJ, Q

Q: TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW07S

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7K101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6492

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	UJ,C
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	~~5~~ 10	~~U~~ U	UJ,ZC
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	UJ,C
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ,C
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW07S

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7K101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6492

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.85~~	~~24~~	~~NJ~~
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW08D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D75101

Sample wt/vol: 0.600 (g/ML) ML Lab File ID: VOL6463

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	83	U	
74-83-9	Bromomethane	83	U	
75-01-4	Vinyl Chloride	83	U	
75-00-3	Chloroethane	83	U	
75-09-2	Methylene Chloride	83	U	
67-64-1	Acetone	~~83~~ 33	~~U~~ J	UJ,z,c
75-15-0	Carbon Disulfide	83	U (A)	
75-35-4	1,1-Dichloroethene	83	U	
75-34-3	1,1-Dichloroethane	83	U	
540-59-0	1,2-Dichloroethene (total)	83	U	
67-66-3	Chloroform	~~30~~ 83	~~U~~ J	1-21.8%
107-06-2	1,2-Dichloroethane	83	U	
78-93-3	2-Butanone	83	U	UJ,c
71-55-6	1,1,1-Trichloroethane	83	U	
56-23-5	Carbon Tetrachloride	1100		
75-27-4	Bromodichloromethane	83	U	
78-87-5	1,2-Dichloropropane	83	U	
10061-01-5	cis-1,3-Dichloropropene	83	U	
79-01-6	Trichloroethene	97		
124-48-1	Dibromochloromethane	83	U	
79-00-5	1,1,2-Trichloroethane	83	U	
71-43-2	Benzene	83	U	
10061-02-6	trans-1,3-Dichloropropene	83	U	
75-25-2	Bromoform	83	U	
108-10-1	4-Methyl-2-pentanone	83	U	
591-78-6	2-Hexanone	83	U	UJ,c
127-18-4	Tetrachloroethene	83	U	
79-34-5	1,1,2,2-Tetrachloroethane	83	U	
108-88-3	Toluene	83	U	
108-90-7	Chlorobenzene	83	U	
100-41-4	Ethylbenzene	83	U	
100-42-5	Styrene	83	U	
1330-20-7	Xylenes (total)	83	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW08D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D75101

Sample wt/vol: 0.600 (g/ML) ML Lab File ID: VOL6463

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	57103-04-5	3,6-BIS(N-DIMETHYLAMINO)-9-E	16.82	48	NJ	NJ,Q
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Q: TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW38D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7F101

Sample wt/vol: 0.400 (g/ML) ML Lab File ID: VOL6466

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
74-87-3	Chloromethane	120	U	
74-83-9	Bromomethane	120	U	
75-01-4	Vinyl Chloride	120	U	
75-00-3	Chloroethane	120	U	
75-09-2	Methylene Chloride	120	U	
67-64-1	Acetone	~~1200~~ 58	~~U~~ J	UJ, ZC
75-15-0	Carbon Disulfide	120	U	
75-35-4	1,1-Dichloroethene	120	U	
75-34-3	1,1-Dichloroethane	120	U	
540-59-0	1,2-Dichloroethene (total)	120	U	
67-66-3	Chloroform	130		
107-06-2	1,2-Dichloroethane	120	U	
78-93-3	2-Butanone	120	U	UJ, C
71-55-6	1,1,1-Trichloroethane	120	U	
56-23-5	Carbon Tetrachloride	1900		
75-27-4	Bromodichloromethane	120	U	
78-87-5	1,2-Dichloropropane	120	U	
10061-01-5	cis-1,3-Dichloropropene	120	U	
79-01-6	Trichloroethene	120	U	
124-48-1	Dibromochloromethane	120	U	
79-00-5	1,1,2-Trichloroethane	120	U	
71-43-2	Benzene	120	U	
10061-02-6	trans-1,3-Dichloropropene	120	U	
75-25-2	Bromoform	120	U	
108-10-1	4-Methyl-2-pentanone	120	U	
591-78-6	2-Hexanone	120	U	UJ, C
127-18-4	Tetrachloroethene	120	U	
79-34-5	1,1,2,2-Tetrachloroethane	120	U	
108-88-3	Toluene	120	U	
108-90-7	Chlorobenzene	120	U	
100-41-4	Ethylbenzene	120	U	
100-42-5	Styrene	120	U	
1330-20-7	Xylenes (total)	120	U	

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW38D

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7F101

Sample wt/vol: 0.400 (g/ML) ML Lab File ID: VOL6466

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	~~CYCLOTETRASILOXANE, OCTAMETH~~	~~16.88~~	~~90~~	~~NJB~~
2.					
3.					
4.					
5.					
6.					
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Data File: /chem/can/msw/a31502.i/L91222A-CLP.b/VOL6490.d

Page 10

Date : 22-DEC-1999 13:43

Client ID: DISCH-1

Instrument: a31502.i

Sample Info: D6D7C101,,5ML/5ML

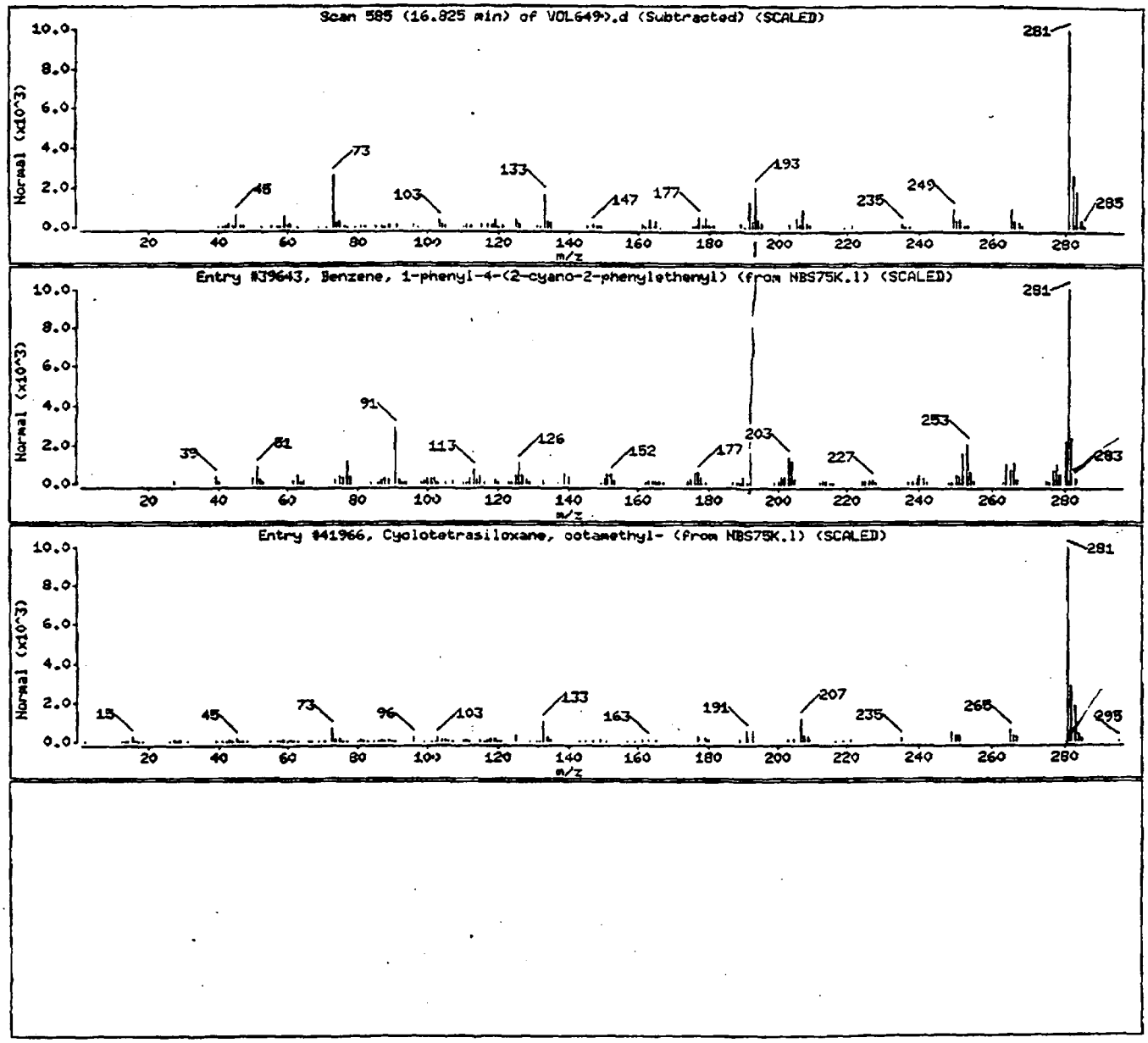
Purge Volume: 5.0

Operator: 1904

Column phase: DB624

Column diameter: 0.53

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
Benzene, 1-phenyl-4-(2-cyano-2-phenyleth	27869-56-3	NBS75K.1	39643	47	C21H15N	281
Cyclotetrasiloxane, octamethyl-	556-67-2	NBS75K.1	41966	36	C8H24O4Si4	296



Data File: /chem/can/msv/a31502.i/L91221A-CLP.b/VOL6463.d

Date : 21-DEC-1999 13:25

Client ID: MW082

Instrument: a31502.i

Sample Info: D6876101,,0.6ML/5ML

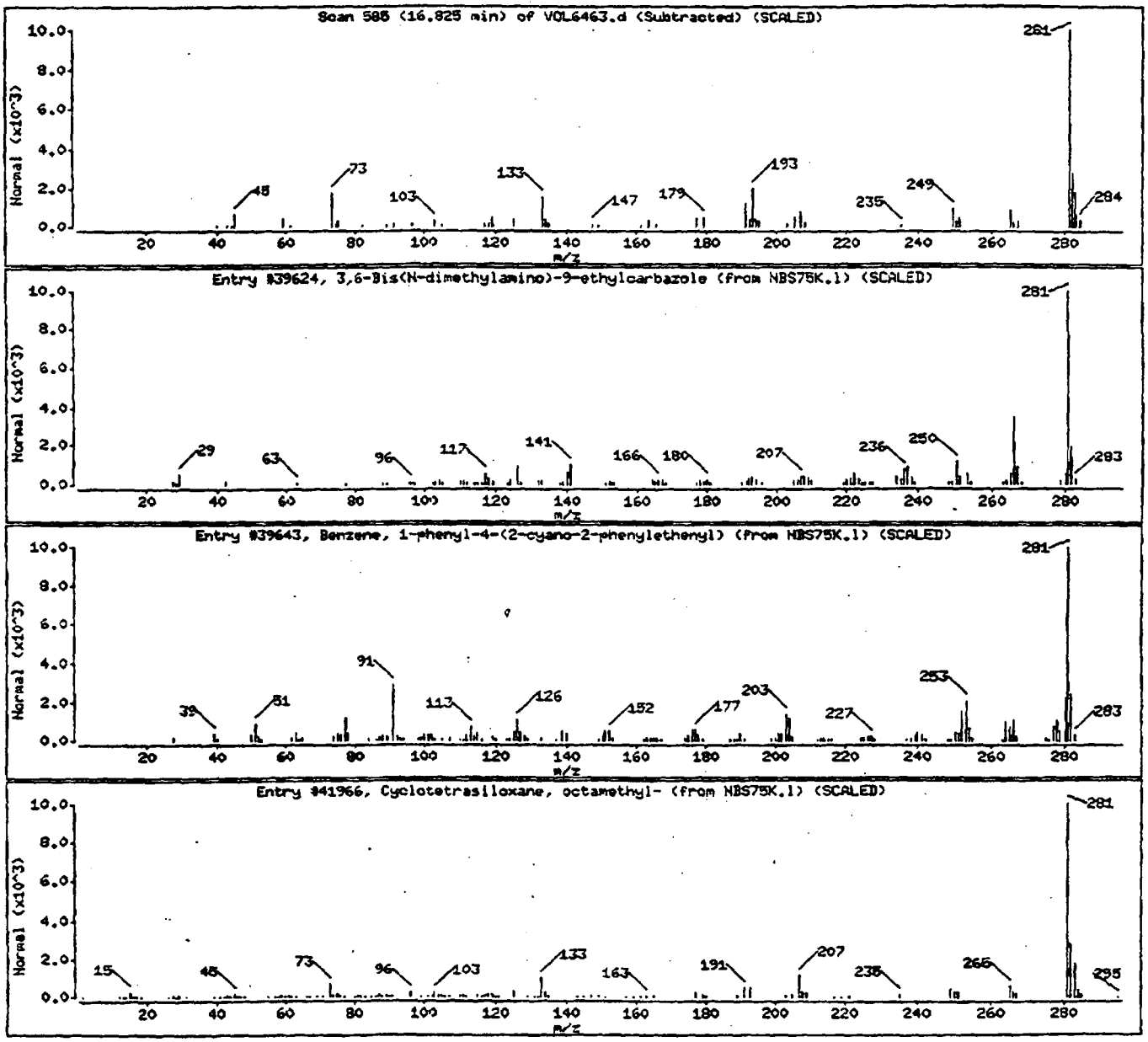
Purge Volume: 0.6

Operator: 1904

Column phase: DB624

Column diameter: 0.53

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
3,6-Bis(N-dimethylamino)-9-ethylcarbazol	57103-04-5	NBS75K.1	39624	50	C18H23N3	281
Benzene, 1-phenyl-4-(2-cyano-2-phenyleth	27869-86-3	NBS75K.1	39643	50	C21H15N	281
Cyclotetrasiloxane, octamethyl-	556-67-2	NBS75K.1	41966	46	C8H24O4Si4	296



Data File: /chem/can/msv/a31502.i/L91221A-CLP.b/VOL6465.d

Date : 21-DEC-1999 14:34

Client ID: MW370

Instrument: a31502.i

Sample Info: B6396101,,2ML/5ML

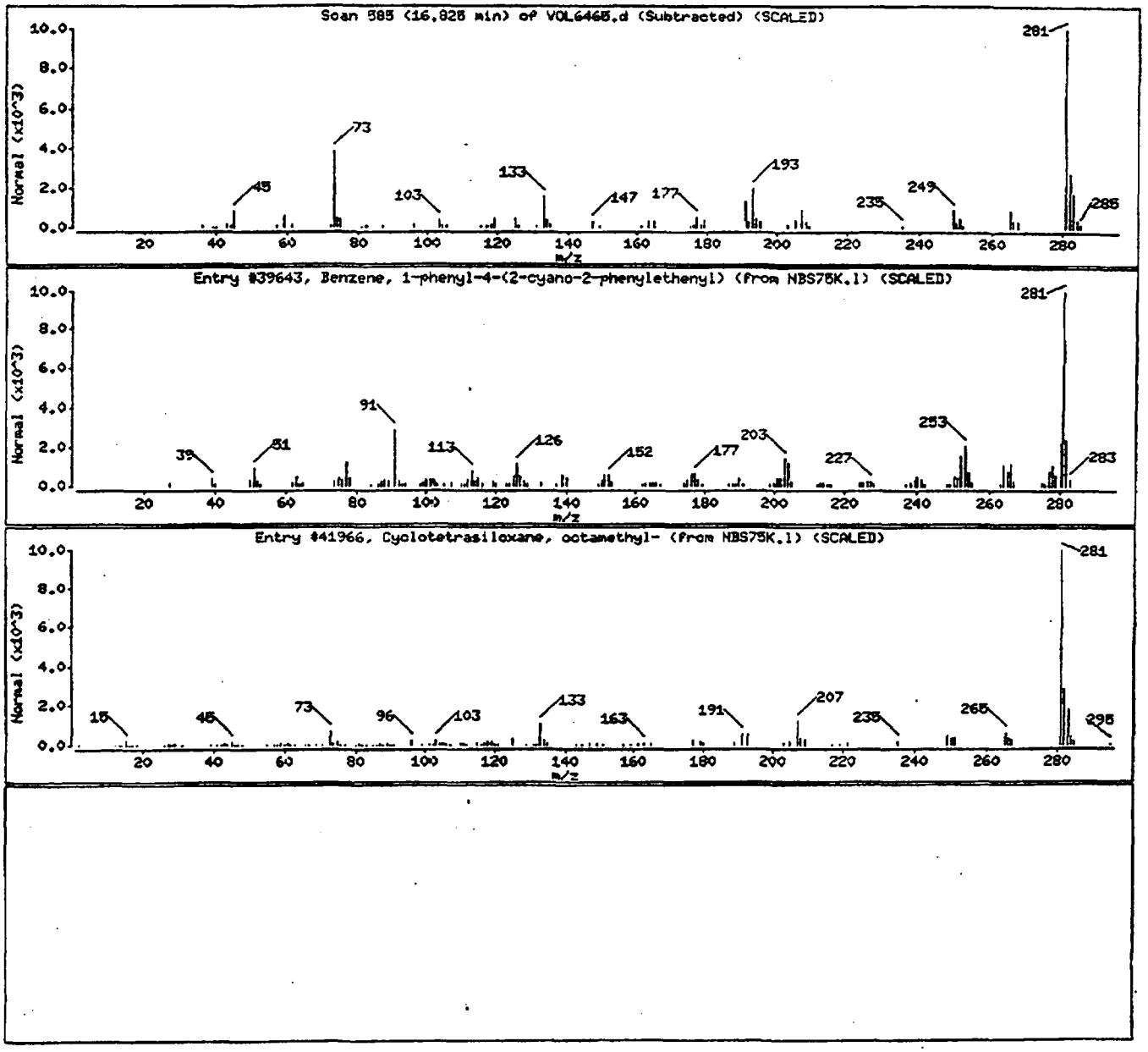
Purge Volume: 2.0

Operator: 1904

Column phase: DB624

Column diameter: 0.83

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
Benzene, 1-phenyl-4-(2-cyano-2-phenyleth	27869-56-3	NBS75K.1	39643	50	C21H15N	281
Cyclotetrasiloxane, octamethyl-	556-67-2	NBS75K.1	41966	39	C8H24O4Si4	296



one example.

Data File: /chem/can/msv/a3i502.i/L91221A-CLP.b/VOL6464.d

Date : 21-DEC-1999 13:52

Client ID: MW08S

Instrument: a3i502.i

Sample Info: D8D6R101,,0.75ML/5ML

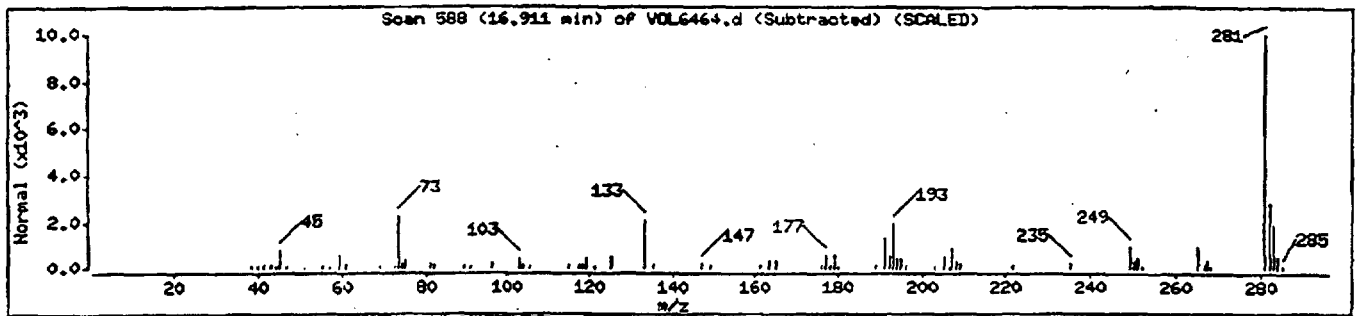
Purge Volume: 0.0

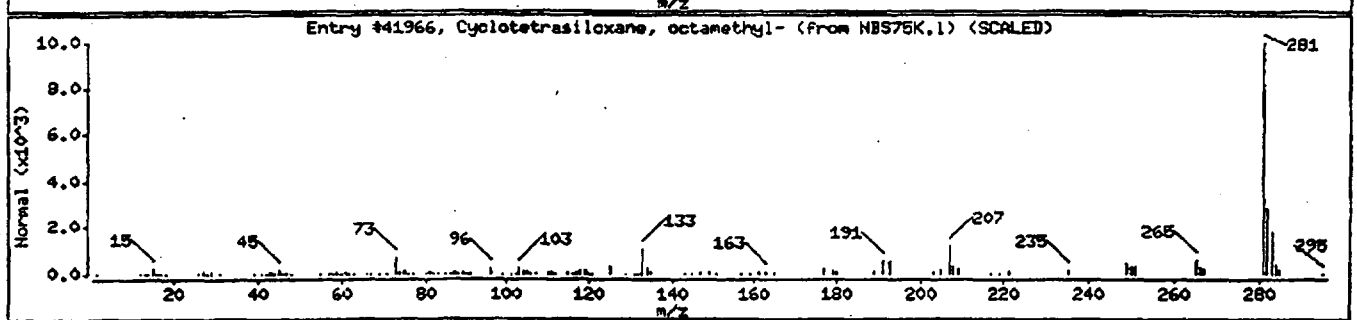
Operator: 1904

Column phase: DB624

Column diameter: 0.53

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
Cyclotetrasiloxane, octamethyl-	556-67-2	NBS75K.l	41966	50	C8H24O4Si4	296
Benzene, 1-phenyl-4-(2-cyano-2-phenyleth	27869-56-3	NBS75K.l	39643	43	C21H15N	281





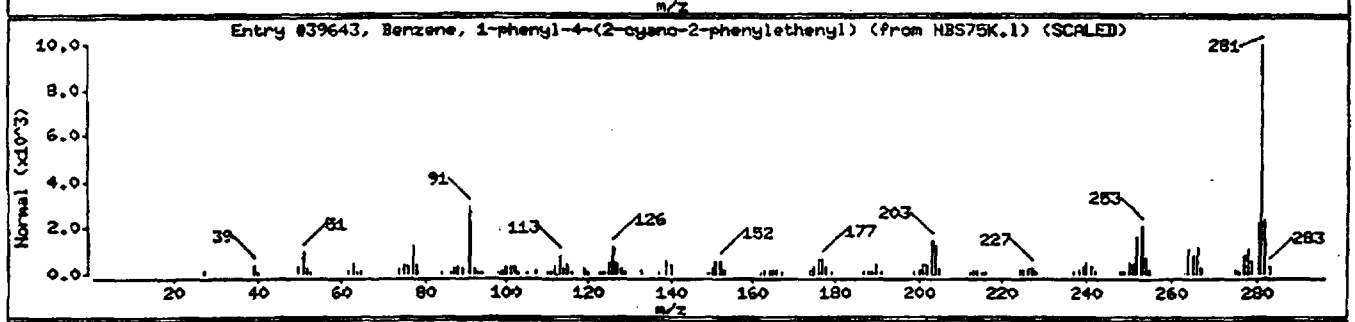


Table 1: Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analyte indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table 2: Reason Codes

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that lead to the application of the data validation flag.

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
A	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
C	Calibration failure; poor or unstable response	b	Instrument performance failure	c	Calibration failure
D	MS/MSD imprecision	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
E	LCSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
F	Field duplicate imprecision	e	LCSD imprecision	f	Field duplicate imprecision
H	Holding time violation	f	Field duplicate imprecision	h	Holding time violation
I	Internal standard failure	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
J	Poor mass spectrometer performance	h	Holding time violation	l	LCS recovery failure
L	LCS recovery failure	i	Internal standard failure	m	MS/MSD recovery failure
M	MS/MSD recovery failure	l	LCS recovery failure	n	ICS failure
P	Poor chromatography	m	MS/MSD recovery failure	o	Calibration blank contamination
R	linearity failure in initial calibration	p	Poor chromatography	p	Preparation blank contamination
S	Surrogate failure	r	linearity failure in initial calibration	r	Linearity failure in calibration or MSA
T	Tuning failure	s	Surrogate failure	s	Serial dilution failure
W	Identification criteria failure	u	No confirmation column	v	Post-digestion spike failure
X	Field blank contamination	w	Retention time failure	x	Field blank contamination
Y	Trip blank contamination	x	Field blank contamination	z	Laboratory storage blank contamination
Z	Method blank contamination	z	Method blank contamination	Q	Other - see bottom of data report for explanation
Q	Other - see bottom of data report for explanation	Q	Other - see bottom of data report for explanation		
K	Tentatively Identified Compounds (TICs)				

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW38DDUP

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7H101

Sample wt/vol: 0.350 (g/ML) ML Lab File ID: VOL6485

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	140	U	
74-83-9	Bromomethane	140	U	
75-01-4	Vinyl Chloride	140	U	
75-00-3	Chloroethane	140	U	UJ,c
75-09-2	Methylene Chloride	140	U	
67-64-1	Acetone	140 U ~~89~~	~~J~~ (1A)	UJ,zc
75-15-0	Carbon Disulfide	140	U	
75-35-4	1,1-Dichloroethene	140	U	
75-34-3	1,1-Dichloroethane	140	U	
540-59-0	1,2-Dichloroethene (total)	140	U	
67-66-3	Chloroform	130	J	
107-06-2	1,2-Dichloroethane	140	U	
78-93-3	2-Butanone	140	U	UJ,c
71-55-6	1,1,1-Trichloroethane	140	U	
56-23-5	Carbon Tetrachloride	2000		
75-27-4	Bromodichloromethane	140	U	
78-87-5	1,2-Dichloropropane	140	U	
10061-01-5	cis-1,3-Dichloropropene	140	U	
79-01-6	Trichloroethene	140	U	
124-48-1	Dibromochloromethane	140	U	
79-00-5	1,1,2-Trichloroethane	140	U	
71-43-2	Benzene	140	U	
10061-02-6	trans-1,3-Dichloropropene	140	U	
75-25-2	Bromoform	140	U	
108-10-1	4-Methyl-2-pentanone	140	U	
591-78-6	2-Hexanone	140	U	UJ,c
127-18-4	Tetrachloroethene	140	U	
79-34-5	1,1,2,2-Tetrachloroethane	140	U	
108-88-3	Toluene	140	U	
108-90-7	Chlorobenzene	140	U	
100-41-4	Ethylbenzene	140	U	
100-42-5	Styrene	140	U	
1330-20-7	Xylenes (total)	140	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW38DDUP

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7H101

Sample wt/vol: 0.350 (g/ML) ML Lab File ID: VOL6485

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRPBLK

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6DC9101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6472

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10	U	
67-64-1	Acetone	10U ~~7 J~~ (2)		UJ, zc
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	UJ, c
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	UJ, c
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylenes (total)	10	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRPBLK

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6DC9101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6472

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec._____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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DATA VALIDATION WORKSHEET
VOLATILE ORGANIC ANALYSIS - NFG (February 1994)

Reviewer: JA
Date: 2/14/00

Project Name ect
Project Number: 37630-003-7003
SDG No.: L15229

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ". If both VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".	[✓]		
1.5	Do any soil samples contain more than 50% water? If any sample analyzed as a soil, other than TCLP, contains 50% - 90% water, all data should be flagged as estimated "J". If a soil sample other than TCLP contains more than 90% water, all data should be qualified as unusable "R".		[✓]	

Note: Cooler temp 7.8°C. (slightly >6°C) JK.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days

Soil/Sediment	4 °C ±2 °C	14 days	14 days

Note: The method maximum holding times, which differ from the technical maximum holding times, state that water and soil samples are to be analyzed within 10 days from the validated time of sample receipt (VTSR) at the laboratory.

		Yes	No	NA
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).	____	[✓]	____

Note:

Date Collected	Date Analyzed	H.T
12/10/99	12/21,22/99	11-12 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)? If any of the information is missing, this information must be obtained from the laboratory.	[✓]	____	____
3.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift? If BFB was analyzed simultaneously with any calibration standard or blank, the IPC is rejected "R" as well as all associated data.	[✓]	____	____
3.3	Have all samples been analyzed within twelve hours of the BFB tune? If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".	[✓]	____	____
3.4	Have ion abundance criteria for BFB been met for each instrument used? If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".	[✓]	____	____
2.5	Are there any transcription/calculation errors between the mass list and summary form relative abundance values? If Yes, recalculate or make the necessary corections. If after recalculation or correction the ion abundance criteria are still not met, then the IPC is not acceptable and all associated data are rejected "R".	____	[✓]	____
2.6	Have sufficient significant figures been reported (3 sig. Fig.)?	[✓]	____	____
2.7	Are spectra for the mass calibration compound acceptable?	[✓]	____	____

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a VOA method blank been analyzed at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	✓		
4.4	Is VOA chromatographic performance (baseline stability) acceptable for each instrument?	[✓]		
4.5	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for VOAs? (If Yes, see attached Blanks Summary Table.)	✓	[ ]	
4.6	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)? (If Yes, see attached Blank Summary Table.)	✓	[ ]	
4.7	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		

Qualification	U	U at CRQL	None
CH_2Cl2, Acetone 2-Butanone	Sample Conc. is > CRQL, but < 10 X blank value.	Sample Conc. is < CRQL and < 10 X blank value.	Sample Conc. is > CRQL and > 10 X blank value.
Other Contaminants	Sample Conc. is > CRQL, but < 5 x blank value.	Sample Conc. is < CRQL and < 5 x blank value.	Sample Conc. is > CRQL and > 5 x blank value.

VBLK2
Hexamethyl-cyclotri-siloxane (6 ug/L)
Octamethyl-cyclo-tetra siloxane (10 ug/L)

Note: TripBlank Acetone 7 ug/L U — FB2 Acetone 9 ug/L U, Octamethyl-Cyclotetra Siloxane 10 ug/L U TIC — VHBLK1 Acetone 9 ug/L, 8 ug/L U — VBLK3 – ALL ND.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms, reconstructed Ion Chromatograms (RIC), and data system printouts (Quant Report) present and complete for each instrument used?	[✓]		
5.2	Are the Initial Calibration forms present and complete at concentrations of 10, 20, 50, 100 and 200 ng for separate calibrations of low water/med. Soil (unheated purge) and low soils (heated purge)? If low level soil samples were not heated during purge, qualify positive hits "J" and non-detects "R".	[✓]		
5.3	Are response factor stable (%RSD values < 30%) for VOC over the concentration range of the calibration?	[✓]		

	30% < %RSD < 50%	50% < %RSD < 90%	%RSD > 90%
Positive	J(+)	J(+)	J(+)
Non-detect	None	UJ(-)	R(-)

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK2

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6WLP101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6457

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	541-05-9	CYCLOTRISILOXANE, HEXAMETHYL	12.91	6	NJ
2.	556-67-2	CYCLOTETRASILOXANE, OCTAMETH	16.82	10	NJ
3.					
4.					
5.					
6.					
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VHBLK1

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7Q101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6471

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	9	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: VHBLK1

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Matrix: (soil/water) WATER Lab Sample ID: D6D7Q101

Sample wt/vol: 5.000 (g/ML) ML Lab File ID: VOL6471

Level: (low/med) LOW Date Received: 12/15/99

% Moisture: not dec. _____ Date Analyzed: 12/21/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	CYCLOTETRASILOXANE, OCTAMETH	16.85	8	NJB
2.					
3.					
4.					
5.					
6.					
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9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[ ]		✓
9.2	Is LCS analyzed at the required frequency for each matrix?	[ ]		✓
9.3	Are all LCS %Rs within acceptance criteria?	[ ]		✓
9.4	Were outlying %R (and RPD) values marked correctly with an asterisk?	[ ]		✓
9.5	Were any calculation/transcription errors found?		[ ]	✓

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

Note: _____

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were all outliers (internal standard areas and/or retention times) marked correctly with an asterisk?	[✓]		
10.4	Were any transcription errors found?		[✓]	

Note: _____

11.0 TCL Identification

		Yes	No	NA
11.1	Are Analysis Data Sheet (Form I) present with required header information on each page, for the following:			
11.1.1	Samples and/or fractions as appropriate	[✓]		
11.1.2	Matrix Spike and Matrix Spike Duplicate	[✓]		
11.1.3	Blanks	[✓]		
11.2	Are VOA RIC, mass spectra for identified compounds, and Quant Reports included in the sample package for the following:	Yes	No	NA
11.2.1	Samples and/or fractions as appropriate	[✓]		
11.2.2	Matrix Spike and Matrix Spike Duplicate	[✓]		
11.2.3	Blanks	[✓]		
11.3	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
11.4	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[ ]	✓	

Note: Sample DISCH-1 TIC (1-phenyl-4-(2-cyano-2-phenylethenyl benzene) → This TIC was identified as octamethyl cyclotetrasiloxane.

12.0 TCL/TIC Quantitation and Reported Detection limits

Sample MW08D (3,6-Bis(N-dimethylamino)-9-ethyl carbazole.

		Yes	No	NA
12.1	Are there any transcription/calculation errors in reported sample results? (verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I results.)		[✓]	
12.2	Are Contract Required Quantitation Limits (CRQL) adjusted to reflect sample dilution(s) and, for soil, sample moisture?	[✓]		

Note:
MW07D - Diluted by a factor 6.7 → TCE 1100. ug/L
MW08D Diluted by a factor 8.3 → CCl4 1100. ug/L
MW38D - Diluted by a factor of 12 → CCl4
MW38Dup - Diluted by a factor of 14 → CCl4

13.0 Tentatively Identified Compounds (TIC)

		Yes	No	NA
13.1	Are all TIC summary forms present; and do listed TIC include scan number or retention time, estimated concentration and "NJ" qualifier?	[✓]		

		Yes	No	NA
5.4	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-). Note: The criteria employed for technical data review purposes are different from those used in the method. The laboratory must meet a minimum RRF criterion of 0.01, however, for data review purposes, the "greater than or equal to 0.05" criterion is applied to all volatile compounds.		[✓]	
5.5	Are there any transcription/calculation errors in reporting of RRF or %RSD values? (see attached calculation worksheet)		[✓]	

Note: Instrument: A3I502 12/9/99 1353-1554

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms, reconstructed Ion Chromatograms (RIC), and data system printouts (Quant Report) present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 25%)? If yes, J(+)/UJ(-).	[ ]	✓	
6.4	Do any continuing calibration standard compounds have a RRF < 0.05? If yes, J(+)/R(-).		[✓]	
6.5	Are there any transcription/calculation errors in reporting of RRF or %D values?		[✓]	

Instrument: A3I502

Note: 12/21/99 0905 Acetone 39.9%. 12/22/99 0923 Chloroethane -32.8% VH
2-butanone 32.9% Acetone 46.7%
2-Hexanone 35.1%. 2-butanone 32.8%
2-Hexanone 31.8%.

VBLK2
MW08D
MW38D
VHBLK1
TRPBLK
FB2

VBLK3
MW38Dup
MW17D
DISCH-1
DISCH-1Dup
MW07S
MW04S
MW04D

⊗ chloroethane

$RRF = \frac{78758}{59070} = 1.333$

$\%D = \frac{1.004 - 1.333}{1.004} = -32.8\%$ VL

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Instrument ID: A3I502 Calibration Date: 12/21/99 Time: 0905

Lab File ID: VOL6455 Init. Calib. Date(s): 12/09/99 12/09/99

Heated Purge: (Y/N) N Init. Calib. Times: 1353 1554

GC Column: DB624 ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.846	0.869		-2.7	
Bromomethane	1.617	1.427	0.100	11.8	25.0
Vinyl Chloride	1.163	1.110	0.100	4.6	25.0
Chloroethane	1.004	1.243		-23.8	
Methylene Chloride	1.593	1.665		-4.5	
Acetone	0.576	0.346		39.9	
Carbon Disulfide	4.620	4.930		-6.7	
1,1-Dichloroethene	1.570	1.620	0.100	-3.2	25.0
1,1-Dichloroethane	3.441	3.460	0.200	-0.6	25.0
1,2-Dichloroethene (total)	1.600	1.621		-1.3	
Chloroform	4.397	4.570	0.200	-3.9	25.0
1,2-Dichloroethane	3.596	3.873	0.100	-7.7	25.0
2-Butanone	0.629	0.422		32.9	
1,1,1-Trichloroethane	0.999	1.054	0.100	-5.5	25.0
Carbon Tetrachloride	0.938	1.019	0.100	-8.6	25.0
Bromodichloromethane	1.154	1.128	0.200	2.2	25.0
1,2-Dichloropropane	0.469	0.439		6.4	
cis-1,3-Dichloropropene	0.755	0.700	0.200	7.3	25.0
Trichloroethene	0.569	0.540	0.300	5.1	25.0
Dibromochloromethane	0.920	0.910	0.100	1.1	25.0
1,1,2-Trichloroethane	0.407	0.387	0.100	4.9	25.0
Benzene	0.985	0.947	0.500	3.8	25.0
trans-1,3-Dichloropropene	0.727	0.708	0.100	2.6	25.0
Bromoform	0.700	0.641	0.100	8.4	25.0
4-Methyl-2-pentanone	0.360	0.270		25.0	
2-Hexanone	0.299	0.194		35.1	
Tetrachloroethene	0.492	0.484	0.200	1.6	25.0
1,1,2,2-Tetrachloroethane	0.559	0.444	0.300	20.6	25.0
Toluene	1.244	1.129	0.400	9.2	25.0
Chlorobenzene	1.037	0.996	0.500	4.0	25.0
Ethylbenzene	0.455	0.441	0.100	3.1	25.0
Styrene	1.044	0.947	0.300	9.3	25.0
Xylenes (total)	0.599	0.568	0.300	5.2	25.0
Toluene-d8	1.117	1.009		9.7	
Bromofluorobenzene	1.134	1.014	0.200	10.6	25.0
1,2-Dichloroethane-d4	3.109	3.267		-5.1	

All other compounds must meet a minimum RRF of 0.010.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA, INC. Contract:

Lab Code: QESOH Case No.: SAS No.: SDG No.: L15229

Instrument ID: A3I502 Calibration Date: 12/22/99 Time: 0923

Lab File ID: VOL6481 Init. Calib. Date(s): 12/09/99 12/09/99

Heated Purge: (Y/N) N Init. Calib. Times: 1353 1554

GC Column: DB624 ID: 0.53 (mm)

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.846	0.885		-4.6	
Bromomethane	1.617	1.482	0.100	8.3	25.0
Vinyl Chloride	1.163	1.126	0.100	3.2	25.0
Chloroethane	1.004	1.333		-32.8	
Methylene Chloride	1.593	1.452		8.8	
Acetone	0.576	0.307		46.7	
Carbon Disulfide	4.620	4.844		-4.8	
1,1-Dichloroethene	1.570	1.593	0.100	-1.5	25.0
1,1-Dichloroethane	3.441	3.487	0.200	-1.3	25.0
1,2-Dichloroethene (total)	1.600	1.595		0.3	
Chloroform	4.397	4.564	0.200	-3.8	25.0
1,2-Dichloroethane	3.596	3.962	0.100	-10.2	25.0
2-Butanone	0.629	0.423		32.8	
1,1,1-Trichloroethane	0.999	1.071	0.100	-7.2	25.0
Carbon Tetrachloride	0.938	1.056	0.100	-12.6	25.0
Bromodichloromethane	1.154	1.199	0.200	-3.9	25.0
1,2-Dichloropropane	0.469	0.458		2.3	
cis-1,3-Dichloropropene	0.755	0.712	0.200	5.7	25.0
Trichloroethene	0.569	0.565	0.300	0.7	25.0
Dibromochloromethane	0.920	0.930	0.100	-1.1	25.0
1,1,2-Trichloroethane	0.407	0.385	0.100	5.4	25.0
Benzene	0.985	0.973	0.500	1.2	25.0
trans-1,3-Dichloropropene	0.727	0.734	0.100	-1.0	25.0
Bromoform	0.700	0.680	0.100	2.8	25.0
4-Methyl-2-pentanone	0.360	0.285		20.8	
2-Hexanone	0.299	0.204		31.8	
Tetrachloroethene	0.492	0.473	0.200	3.9	25.0
1,1,2,2-Tetrachloroethane	0.559	0.422	0.300	24.5	25.0
Toluene	1.244	1.124	0.400	9.6	25.0
Chlorobenzene	1.037	0.994	0.500	4.1	25.0
Ethylbenzene	0.455	0.442	0.100	2.8	25.0
Styrene	1.044	0.964	0.300	7.7	25.0
Xylenes (total)	0.599	0.579	0.300	3.3	25.0
Toluene-d8	1.117	0.994		11.0	
Bromofluorobenzene	1.134	1.051	0.200	7.3	25.0
1,2-Dichloroethane-d4	3.109	3.328		-7.0	

All other compounds must meet a minimum RRF of 0.010.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all VOA samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓

Note: If medium level soil field sample or method blanks do not meet acceptable criteria, the extract must be reanalyzed first to determine if there is a problem with the analysis. If reanalysis of the extract does not solve the problem, then the laboratory must reextract the medium soil sample and analyze the second extract.

		Yes	No	NA
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were outliers marked correctly with an asterisk?	[✓]	✓	
7.6	Were any transcription/calculation errors found between the raw data and surrogate summary forms?		[✓]	

Note: _____

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were outlying %R and RPD values marked correctly with an asterisk?	[✓]		
8.5	Were any calculation/transcription errors found?		[✓]	

Note: MS/MSD - MW38D.

		Yes	No	NA
13.2	Are mass spectra for TIC and associated "best match" spectra included in the sample package for samples and blanks?	[✓]		
13.3	Are any TCL compounds (VOA and/or SVOA) listed as a TIC (example: 1,2-dimethylbenznee is o-xylene or 2-butanone is methyl ethyl ketone -- a VOA TCL --and should not be reported as a TIC)?		[✓]	
13.4	Are all ions present in the reference mass spectrum, with a relative intensity greater than 10%, also present in the sample mass spectrum; and do TIC "best match' standard relative ion intensities agree within 20%?	[✓]		

Note: _____

14.0 System Performance

		Yes	No	NA
14.1	Is chromatographic performance acceptable with respect to:			
14.1.1	Baseline stability	[✓]		
14.1.2	Resolution	[✓]		
14,1,3	Peak sharp	[✓]		
14.1.4	Full-scare graph (attenuation)	[✓]		
14.1.5	Other:_____	[ ]		✓

Note: _____

15.0 Field Duplicate Samples

		Yes	No	NA
8.1	Were any field duplicates submitted for VOC analysis?	[✓]		
8.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
8.3	Were all RPD or absolute difference values within the control limits?	[✓]		

Note:

	DISH-1	/ DISH-1 Dup.	RPD		MW38D	/ MW38D Dup	RPD
Acetone	5J	6J	18.2%	Acetone	58	89	42.2%
2-butanone	6J	6J	0.0%	Chloroform	130	130	0.0%
2 TICs				CCl_4	1900	2000	5.1%

Difference = 31 ug/L RL = 140 ug/L ok

Fax Sheet

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TO: Ken Kuzior COMPANY: STL-Quanterra FAX NUMBER: 330-497-0772

FROM: Jason Ai

DATE: 2/15/00

SUBJECT: Questions for project

NO OF PAGES: 5

REFERENCE NO: 37630-003

MESSAGE:

Ken: Please check the following question:

1) In sample DISCH-1, MW08D (L15229) and MW37D(L15219) There is one TIC in each sample (had same mass spectra) However, this TIC was identified as difficient compound in each sample (see attached)

This TIC was identified as ~~octa~~ octamethyl cyclotetrasiloxane. (See attached example-MW08S).

2) In each SDG - contain on VHBLK sample. Is this storage blank? or other?